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(12) United States Patent

Christie et al.

(54) METHOD FOR INCREASING THE DEPTH OF FOCUS OF A PATIENT

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(56) References Cited

U.S. PATENT DOCUMENTS

564,518 A 7/1896 Heilborn 1,206,132 A 11/1916 Otte (Continued)

FOREIGN PATENT DOCUMENTS

EP 0 457 553 A2 11/1991 FR 369 993 1/1907 (Continued)

OTHER PUBLICATIONS

EPO Supplementary Search Report for Application No. 04753697.4, dated Apr. 21, 2008 in 3 pages.

(Continued)

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(57) ABSTRACT

A mask configured to be implanted in a cornea of a patient to increase the depth of focus of the patient includes an anterior surface, a posterior surface, and a plurality of holes. The anterior surface is configured to reside adjacent a first corneal layer. The posterior surface is configured to reside adjacent a second corneal layer. The plurality of holes extends at least partially between the anterior surface and the posterior surface. The holes of the plurality of holes are configured to substantially eliminate visible diffraction patterns.

28 Claims, 31 Drawing Sheets

